Claims:

1. A media converter for converting from one type of media to another, comprising:

a first physical-layer interface to a first transmission medium;

a second physical-layer interface to a second transmission medium;

a memory connected between the first and second physical-layer interfaces, for temporarily storing data to be transferred between the first and second physical-layer interfaces;

a determiner for determining whether a received block of data stored in the memory includes predetermined data at a predetermined position of the received block of data; and

a controller controlling such that, when it is determined that the received block of data stored in the memory includes the predetermined data, a response block of data corresponding to the received block of data is sent from a corresponding one of the first and second physical-layer interfaces back to a source that has transmitted the received block of data.

2. The media converter according to claim 1, wherein each of the received and response blocks of data is an Ethernet

packet having a predetermined format.

3. The media converter according to claim 2, wherein the predetermined data is stored in a source address field of the received block of data.

4. The media converter according to claim 1, wherein the predetermined data is an identification number uniquely assigned to the media converter.

5. The media converter according to claim 2, wherein the predetermined data is an identification number uniquely assigned to the media converter.

6. The media converter according to claim 1, wherein each of the first and second physical-layer interfaces supports MII (Media Independent Interface) conforming to IEEE802.3 standards.

7. The media converter according to claim 6, wherein when it is determined that the received block of data stored in the memory includes the predetermined data, the controller accesses another one of the first and second physical-layer interfaces to acquire link information from the other physical-layer interface and generates the response block of data corresponding to the link information.

8. The media converter according to claim 6, wherein the controller has a missing link function such that, when one of the first and second physical-layer interfaces comes into link disconnection, the other one of the first and second physical-layer interfaces also comes into link disconnection.

9. The media converter according to claim 8, wherein, when it is determined that the received block of data stored in the memory includes the predetermined data under missing link state, the controller disables the missing link state to transmit the response block of data back to the source.

10. The media converter according to claim 8, wherein, when it is determined that the received block of data stored in the memory does not include the predetermined data under missing link state, the controller switches its operation mode from the missing link state to a normal mode to transfer the received block of data to the other one of the first and second physical-layer interfaces.

11. A control method for controlling a media converter comprising:

a first physical-layer interface to a first transmission medium;

a second physical-layer interface to a second

transmission medium; and

a memory connected between the first and second physical-layer interfaces, for temporarily storing data to be transferred between the first and second physical-layer interfaces,

the control method comprising the steps of:

a) determining whether a received block of data stored in the memory includes predetermined data at a predetermined position of the received block of data; and

b) when it is determined that the received block of data stored in the memory includes the predetermined data, generating a response block of data corresponding to the received block of data; and

c) transmitting the response block of data from a corresponding one of the first and second physical-layer interfaces back to a source that has transmitted the received block of data.

12. The control method according to claim 11, wherein the predetermined data is an identification number uniquely assigned to the media converter.

13. The control method according to claim 11, wherein each of the first and second physical-layer interfaces supports MII (Media Independent Interface) conforming to IEEE802.3 standards.

14. The control method according to claim 13, wherein the step (b) comprises the steps of:

when it is determined that the received block of data stored in the memory includes the predetermined data, accessing another one of the first and second physical-layer interfaces to acquire link information from the other physical-layer interface; and

generating the response block of data corresponding to the link information.

15. A control method for controlling a media converter comprising:

a first physical-layer interface to a first transmission medium;

a second physical-layer interface to a second transmission medium; and

a memory connected between the first and second physical-layer interfaces, for temporarily storing data to be transferred between the first and second physical-layer interfaces, wherein each of the first and second physical-layer interfaces supports MII (Media Independent Interface) conforming to IEEE802.3 standards,

the control method comprising the steps of:

a) determining whether a received block of data stored in the memory includes predetermined data at a

predetermined position of the received block of data;

b) when it is determined that the received block of data stored in the memory includes the predetermined data, generating a response block of data corresponding to the received block of data;

c) determining whether the media converter is in a missing link state such that, when one of the first and second physical-layer interfaces comes into link disconnection, the other one of the first and second physical-layer interfaces also comes into link disconnection; and

d) when it is determined that the received block of data stored in the memory includes the predetermined data under missing link state, disabling the missing link state to transmit the response block of data from a corresponding one of the first and second physical-layer interfaces back to a source that has transmitted the received block of data.

16. The control method according to claim 15, further comprising the step of:

when it is determined that the received block of data stored in the memory does not include the predetermined data under missing link state, disabling the missing link state to transfer the received block of data to the other one of the first and second physical-layer interfaces.

17. The control method according to claim 15, wherein

each of the received and response blocks of data is an Ethernet packet having a predetermined format.

18. The control method according to claim 15, wherein the predetermined data is an identification number uniquely assigned to the media converter.

19. A method for detecting a failure on a link including a plurality of media converters, each of which converts from one type of media to another, comprising the steps of:

a) transmitting a block of data to each of the media converters, the block of data having identification data of the media converter written in a predetermined position of the block of data;

b) determining whether a response block of data is received from a corresponding media converter within a predetermined time period; and

c) determining a location of a failure based on a determination result of the step (b).

20. The method according to claim 19, wherein, in the step (c), when a response block of data is not received from a corresponding media converter within a predetermined time period, it is determined that a failure occurs at a location beyond the corresponding media converter.

21. The method according to claim 19, wherein each of the media converters comprises:

a first physical-layer interface to a first transmission medium;

a second physical-layer interface to a second transmission medium; and

a memory connected between the first and second physical-layer interfaces, for temporarily storing data to be transferred between the first and second physical-layer interfaces,

the method further comprising the steps of:

at the media converter,

determining whether a received block of data stored in the memory includes the identification data of its own at a predetermined position of the received block of data;

when it is determined that the received block of data stored in the memory includes the identification data, generating a response block of data corresponding to the received block of data; and

transmitting the response block of data from a corresponding one of the first and second physical-layer interfaces back to a source that has transmitted the received block of data.

22. The method according to claim 21, wherein each of the first and second physical-layer interfaces supports MII

(Media Independent Interface) conforming to IEEE802.3 standards.

23. The method according to claim 22, further comprising the steps of:

at the media converter,

when it is determined that the received block of data stored in the memory includes the identification data of its own, accessing another one of the first and second physical-layer interfaces to acquire link information from the other physical-layer interface; and

generating the response block of data corresponding to the link information.

24. The method according to claim 19, wherein each of the media converters comprises:

a first physical-layer interface to a first transmission medium, the first physical-layer interface supporting MII (Media Independent Interface) conforming to IEEE802.3 standards;

a second physical-layer interface to a second transmission medium, the second physical-layer interface supporting MII conforming to IEEE802.3 standards; and

a memory connected between the first and second physical-layer interfaces, for temporarily storing data to be transferred between the first and second physical-layer

interfaces,

the method further comprising the steps of:

at the media converter,

a) determining whether a received block of data stored in the memory includes the identification data of its own at a predetermined position of the received block of data;

b) when it is determined that the received block of data stored in the memory includes the identification data, generating a response block of data corresponding to the received block of data;

c) when it is determined that the received block of data stored in the memory includes the identification data in a missing link state, disabling a missing link state; and

d) transmit the response block of data to a source that has transmitted the received block of data.

25. The method according to claim 24, further comprising the step of:

when it is determined that the received block of data stored in the memory does not include the identification data under the missing link state, disabling the missing link state to transfer the received block of data to the other one of the first and second physical-layer interfaces.

26. A system for detecting a failure on a link including a plurality of media converters, each of which converts from

one type of media to another, comprising:

a test manager connected to one of the media converters,

wherein each of the media converters comprises:

a first physical-layer interface to a first transmission medium;

a second physical-layer interface to a second transmission medium;

a memory connected between the first and second physical-layer interfaces, for temporarily storing data to be transferred between the first and second physical-layer interfaces; and

a media converter controller determining whether a received block of data stored in the memory includes the identification data of its own at a predetermined position of the received block of data; when it is determined that the received block of data stored in the memory includes the identification data, generating a response block of data corresponding to the received block of data; and transmitting the response block of data from a corresponding one of the first and second physical-layer interfaces back to a source that has transmitted the received block of data, and

the test manager comprises:

an interface to a network manager; and

a test manager controller transmitting a block of data to each of the media converters, the block of data having

identification data of the media converter written in a predetermined position of the block of data; determining whether a response block of data is received from a corresponding media converter within a predetermined time period; and determining a location of a failure based on a determination result.

27. The system according to claim 26, wherein the test manager controller determines that a failure occurs at a location beyond the corresponding media converter when a response block of data is not received from a corresponding media converter within a predetermined time period.

28. The system according to claim 26, wherein each of the first and second physical-layer interfaces supports MII (Media Independent Interface) conforming to IEEE802.3 standards.

29. The system according to claim 28, wherein the media converter controller accesses another one of the first and second physical-layer interfaces to acquire link information from the other physical-layer interface when it is determined that the received block of data stored in the memory includes the identification data of its own and generates the response block of data corresponding to the link information.

30. The system according to claim 28, wherein the

test manager controller disables the missing link state when a test is started and forces a corresponding physical-layer interface into transmittable state to transmit the block of data to the link.

31. The system according to claim 28, wherein the media converter controller determines whether a received block of data stored in the memory includes the identification data of its own at a predetermined position of the received block of data; generates a response block of data corresponding to the received block of data when it is determined that the received block of data stored in the memory includes the identification data; disables a missing link state when it is determined that the received block of data stored in the memory includes the identification data in the missing link state; and transmits the response block of data to a source that has transmitted the received block of data.

32. The system according to claim 31, wherein when it is determined that the received block of data stored in the memory does not include the identification data under the missing link state, the media converter controller disables the missing link state to transfer the received block of data to the other one of the first and second physical-layer interfaces.

33. A media converter with a test manager for use in a failure detection of a link composed of a plurality of types of transmission media, comprising:

a first physical-layer interface to a first transmission medium;

a second physical-layer interface to a second transmission medium;

a memory connected between the first and second physical-layer interfaces, for temporarily storing data to be transferred between the first and second physical-layer interfaces;

a media converter controller determining whether a received block of data stored in the memory includes the identification data of its own at a predetermined position of the received block of data; when it is determined that the received block of data stored in the memory includes the identification data, generating a response block of data corresponding to the received block of data; and transmitting the response block of data from a corresponding one of the first and second physical-layer interfaces back to a source that has transmitted the received block of data;

an interface to a network manager; and

a test manager controller transmitting a block of data to each of the media converters, the block of data having identification data of the media converter written in a predetermined position of the block of data; determining whether

a response block of data is received from a corresponding media converter within a predetermined time period; and determining a location of a failure based on a determination result.

34. A media converter with a test manager for use in a failure detection of a link composed of a plurality of types of transmission media, comprising:

a plurality of media converter; and

a test manager for managing the media converters,

wherein each of the media converter comprises:

a first physical-layer interface to a first transmission medium;

a second physical-layer interface to a second transmission medium;

a memory connected between the first and second physical-layer interfaces, for temporarily storing data to be transferred between the first and second physical-layer interfaces; and

a media converter controller determining whether a received block of data stored in the memory includes the identification data of its own at a predetermined position of the received block of data; when it is determined that the received block of data stored in the memory includes the identification data, generating a response block of data corresponding to the received block of data; and transmitting the response block of data from a corresponding one of the first

and second physical-layer interfaces back to a source that has transmitted the received block of data, and

the test manager comprises:

an interface to a network manager; and

a test manager controller transmitting a block of data to each of the media converters, the block of data having identification data of the media converter written in a predetermined position of the block of data; determining whether a response block of data is received from a corresponding media converter within a predetermined time period; and determining a location of a failure based on a determination result.